

### **ABSTRACT**

Semiconductor devices and fabrication methods are disclosed, in which one or more low silicon-hydrogen SiN barriers are provided to inhibit hydrogen  
5 diffusion into ferroelectric capacitors and into transistor gate dielectric interface areas. The barriers may be used as etch stop layers in various levels of the semiconductor device structure above and/or below the level at which the ferroelectric capacitors are formed so as to reduce the hydrogen related degradation of the switched polarization properties of the ferroelectric capacitors  
10 and to reduce negative bias temperature instability in the device transistors.